

FIGURE 1: RELATIONSHIPS BETWEEN PARTIES

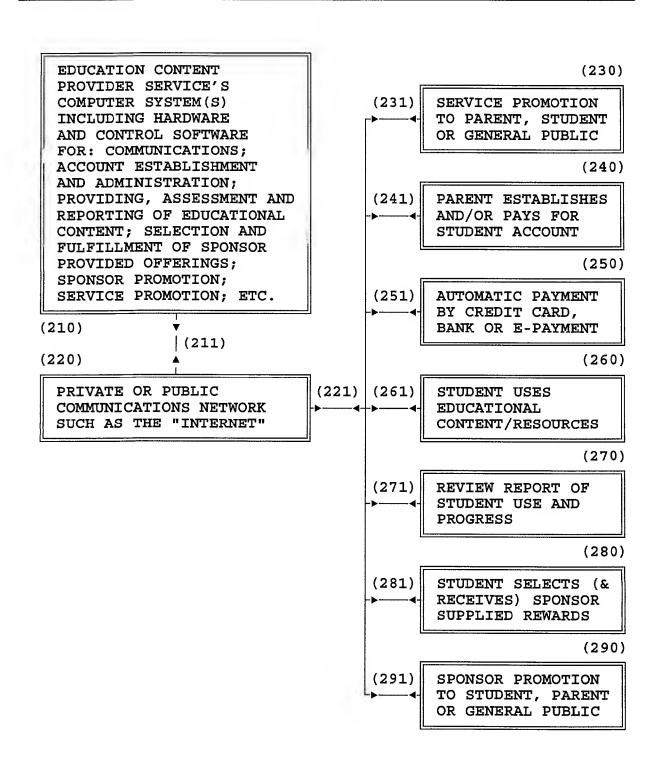


FIGURE 2: Examples of Network-Mediated Functions

310	ACCOUNT INFORMATION	ON: EXAMPLES, SOME DETAILS OMITTED
311	PARENT LOGIN	DADDY06
312	PARENT PASSWORD	IPAY4IT
319	PARENT NAME	DR. SAMUEL CONCERNED
316	PARENT CONTACT	123 MAIN; 212/333-4444; drwc@att.com
319	PARENT PAYMENT	VISA 1234-777888-90112
316	STUDENT LOGIN	SONOFSAM
317	STUDENT PASSWORD	NOTBYCHOICE
319	STUDENT NAME	SAMUEL CONCERNED, JR.
319	STUDENT CONTACT	123 MAIN; 212/333-4445; sos@att.com
320	SERVICES	STANDARD MATH & INTENSIVE VERBAL
321	INCENTIVES	ALL OK BUT COSMETICS

FIGURE 3: EXAMPLE OF ACCOUNT INFORMATION DATABASE ENTRY

410	WEEKLY STUDENT US	E: EXAMPLES, SOME DETAILS OMITTED
411	MONDAY USE	YES; SCORE 80%; POINTS 1
412	TUESDAY USE	YES; SCORE 90%; POINTS 1
413	WEDNESDAY USE	YES; SCORE 60%; POINTS 1
414	THURSDAY USE	NO; SCORE NIL; POINTS 0
415	FRIDAY USE	YES; SCORE 70%; POINTS 1
416	SATURDAY USE	YES; SCORE 70%; POINTS 2
417	SUNDAY USE	YES; SCORE 80%; POINTS 2
418	WEEKLY SCORE	6 VISITS; AVERAGE SCORE 75%; 8 POINTS
419	REWARD OFFERED	LEVEL 2 MUSIC OR LEVEL ONE CLOTHING

FIGURE 4: EXAMPLE OF WEEKLY A STUDENT USE DATABASE ENTRY

510	STUDENT PROGRESS I	REPORT: EXAMPLES, SOME DETAILS OMITTED
511	MATH WEEK 1	AVERAGE SCORE 60%
512	VERBAL WEEK 1	AVERAGE SCORE 90%
	• • •	
513	MATH WEEK N	AVERAGE SCORE 80%
514	VERBAL WEEK N	AVERAGE SCORE 80%
515	MATH PROGRESS	MODERATE SCORE; VERY GOOD PROGRESS
516	VERBAL PROGRESS	GOOD SCORE; BUT NO PROGRESS
517	RECOMMENDATION 1	MATH: ISOSCELES RIGHT TRIANGLE PROBLEM
518	RECOMMENDATION 2	VERBAL: PRACTICE SUPPLIED VOCABULARY
	• •	
519	RECOMMENDATION N	GENERAL: SKIP FEWER PRACTICE SESSIONS

FIGURE 5: EXAMPLES OF A STUDENT PROGRESS REPORT DATABASE ENTRY

610	STUDENT/PROBLEM	PROGRESS: EXAMPLES, SOME DETAILS OMITTED
611	PROBLEM 1	RIGHT ISOSCELES TRIANGLE
612	ENCOUNTER 1	VERSION 6; CORRECT; SESSION 2
613	ENCOUNTER 2	VERSION 3; CORRECT; SESSION 5
614	STATUS	MASTERED; REPEAT ONLY IF TIME
	• • •	
619	CONTINUATION	ONLY AS NEEDED

620	STUDENT/PROBLEM	PROGRESS: EXAMPLES, SOME DETAILS OMITTED
621	PROBLEM 2	30°/60°/90° TRIANGLE
622	ENCOUNTER 1	VERSION 2; INCORRECT; SESSION 2
623	ENCOUNTER 2	VERSION 4; INCORRECT; SESSION 3
624	ENCOUNTER 3	VERSION 6; CORRECT; SESSION 4
625	ENCOUNTER 4	VERSION 1; CORRECT; SESSION 6
624	ENCOUNTER 5	VERSION 3; CORRECT; SESSION 12
627	STATUS	MASTERED; BUT REPEAT TO CONFIRM
	• • •	
629	CONTINUATION	ONLY AS NEEDED

FIGURE 6: EXAMPLES OF STUDENT/PROBLEM PROGRESS REPORT DATABASE ENTRIES

PROBLEM STRUCTURE:	EXAMPLES, SOME DETAILS OMITTED
NAME	3/4/5 TRIANGLE
PROBLEM/VERSION	PROBLEM 27 VERSION 2
TEXT FOR PROBLEM	"Side A of triangle is 10 inches"
PROBLEM GRAPHIC	P27V2.GIF
ANSWER A TEXT	"6 inches"
ANSWER B TEXT	"6 feet"
ANSWER C TEXT	"8 inches"
ANSWER D TEXT	"10 inches"
ANSWER B TEXT	"5 inches"
CORRECT ANSWER	A
CORRECT ACTION A	"Congratulations, you recognized"
INCOR. ACT. B-D	"Sorry, CLICK HERE to review 3/4/5"
INCOR. ACTION E	"This is not a 30°/60°/90°"
ACTION E GRAPHIC	P27ACTE.GIF
REVIEW TEXT	"This is an example of a 3/4/5"
REVIEW GRAPHIC	P27REV.GIF
ADDITIONAL HELP	"For additional help see Schaum's"
STATISTICS	Historical use by all students
	PROBLEM/VERSION TEXT FOR PROBLEM PROBLEM GRAPHIC ANSWER A TEXT ANSWER B TEXT ANSWER C TEXT ANSWER D TEXT ANSWER B TEXT CORRECT ANSWER CORRECT ACTION A INCOR. ACTION E ACTION E GRAPHIC REVIEW TEXT REVIEW GRAPHIC ADDITIONAL HELP

FIGURE 7: EXAMPLE OF A PROBLEM STRUCTURE DATABASE ENTRY

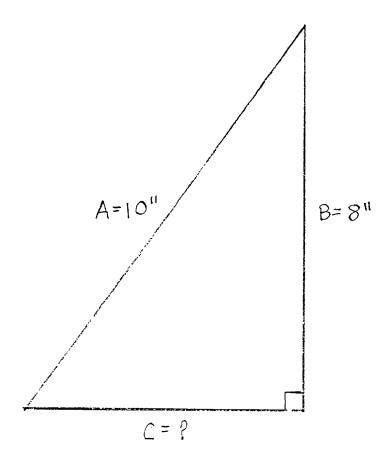


FIGURE 8: EXAMPLE OF A PROBLEM STATEMENT ILLUSTRATION

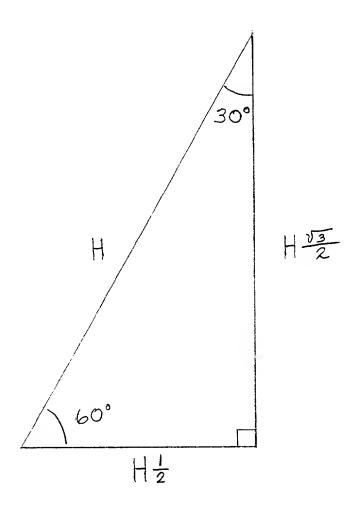


FIGURE 9: EXAMPLE OF AN ANSWER CORRECTION ILLUSTRATION

(1000)

(1010)

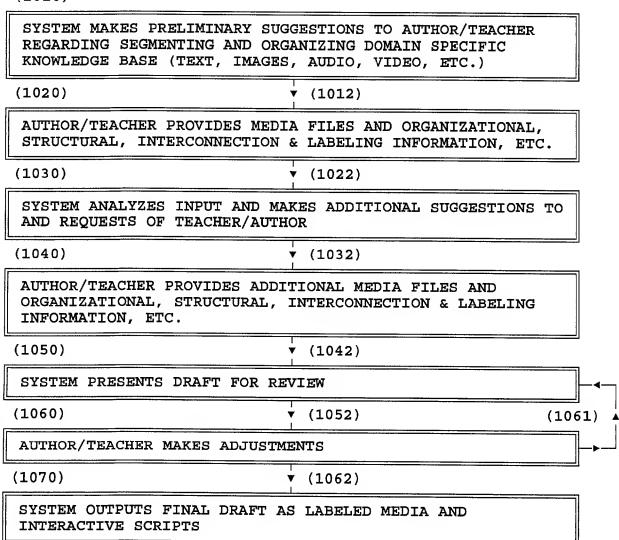


FIGURE 10: OVERALL SYSTEM FLOW — AUTHORING (TEACHING) MODE

(1100)

SYSTEM PRESENTS MATERIAL IN DEFAULT MODE OR, OF POSSIBLE, IN MODE INDICATED BY STUDENT PROFILE/HISTORY AND TYPE OF MATERIAL (PEDAGOGICAL AND COGNITIVE LABELS, ETC.)

(1120) **▼** (1112)

STUDENT INTERACTS WITH MATERIAL, INCLUDING ASSESSMENT

(1130) **▼** (1122)

SYSTEM ANALYZES STUDENT ANSWERS

(1140) ▼ **(1132)**

SYSTEM REPEATS OR ADDS MATERIAL AND ASSESSMENT AS NEEDED AND ADJUSTS LEVEL OF DETAIL OR COMPLEXITY, TYPE OF MEDIA OF PRESENTATION, ETC. BASED ON SEVERAL INPUTS

(1151)

SYSTEM ANALYZES KEYBOARD AND MOUSE DYNAMICS TO DETERMINE STUDENT INTEREST, LEVEL OF ATTENTION, ETC.

(1160)

(1152) (1161)

SYSTEM ANALYZES STUDENT VOICE & FACE TO DETERMINE STUDENT INTEREST, LEVEL OF ATTENTION, ETC.

(1170)

(1110)

(1162)

(1171)

STUDENT MAKES SPECIFIC REQUESTS TO ADJUST LEVEL OF DETAIL SPEED OF PRESENTATION, TYPE OF MEDIA, OR FOR ADDITIONAL INFORMATION VIA SEVERAL TYPES OF "HELP" REQUESTS

(1180)

(1172)

SYSTEM UPDATES STUDENT PROFILE BASED ON PERFORMANCE AND MEDIA LABELS; KEEPS BOOKMARK STRUCTURE; GENERATES REPORTS

FIGURE 11: OVERALL SYSTEM FLOW — PRESENTATION (LEARNING) MODE

(1200)

(1210)

PRELIMINARY SYSTEM QUERIES
(ELEMENTS OPTIONAL AND UPDATABLE):

Title of [sub]-unit?
What is knowledge [sub-]domain?
What is subject?
Who is (are) audience(s)?
Purpose of material?
Use (applications) of material?
Characterize theoretical vs. practical;
abstract vs. concrete; etc.
Prerequisite courses, units, sub-units skills?
Pointers to related materials?
Add your own tags and visible/hidden/help comments.
Etc.

(1220)

(1212)

ATOMIZING AND ORGANIZING OF MATERIAL (ELEMENTS OPTIONAL AND UPDATABLE):

List key concepts, points, facts to be presented. Organize into default, multi-tier, outline.

Specify recommended (required) internal prerequisites. Specify internal relations.

Add your own tags and visible/hidden/help comments.

(1230)

(1222)

ETC.

FIGURE 12: EXAMPLES OF EXPANSION OF ELEMENT (1010)

(1300)

(1310)

IN RESPONSE TO FINISHING A CONCEPTUAL UNIT, SYSTEM ASKS THE FOLLOWING TO CONSTRUCT INTERACTIVE ASSESSMENT SCRIPT: What question(s) would you ask to confirm mastery of this material?"

AND FOR EACH QUESTION:

What is a correct answer?

What is an expected wrong answer(s)?

If a student chose this wrong answer, what would you tell them, in order to clarify their understanding? What re-enforcing or remedial material would you recommend presenting?

Etc.

(1320)

(1312)

IN RESPONSE TO FINISHING A CONCEPTUAL [SUB] -UNIT, SYSTEM ASKS THE FOLLOWING TO CONSTRUCT ALTERNATE PRESENTATIONS WITH DISTINCT LEVELS OF DETAIL AND OTHER DIFFERENCES:

State that again, but in different language.

State that again, but in more detail (or more complex).

State that again, but in less detail (or simpler).

State an analogy that illustrates this concept.

Provide graphic/animation that illustrates this concept.

Provide pointer(s) to background material.

Provide an example of how this material/concept is used.

Tell me what this material/concept is good for.

Etc.

(1330)

(1322)

IN RESPONSE TO FINDING A NEW TERM:

That term is unfamiliar - please supply a definition.

(1340)

(1332)

IN RESPONSE TO FINDING A TERM DISCUSSED ELSEWHERE:

Should that other material be marked as prerequisite? Should that other material be marked as related?

(1350)

(1342)

ETC.

FIGURE 13: EXAMPLES OF EXPANSION OF ELEMENT (1030)

(1400)

(1410)

IF UNFAMILIAR TERM ENCOUNTERED CHECK TERM AGAINST DOMAIN SPECIFIC GLOSSARY OF TERMS OF ART - IF FOUND RETURN, ELSE

(1420)

(1412)

CHECK TERM AGAINST GENERAL DICTIONARY IF FOUND RETURN, ELSE

(1430)

(1422)

MARK WORK TO CHECK FOR SPELLING AND, IF NOT MIS-SPELLED, ADD WORD TO LIST OF WORDS TO LATER QUERY FOR INCLUSION IN GLOSSARY AND TO CONSIDER FOR HOTLINKING

(1440)

√ (1432)

INCREMENT COUNTER AND, IF FREQUENCY THRESHOLD (FOR UNIT OR ENTIRE WORK) IS EXCEEDED, INTERRUPT IN REAL TIME FOR ENTRY OF DEFINITION AND HOTLINK DECISION

▼ (1442) RETURN

FIGURE 14: EXAMPLE OF EXPANSION OF ELEMENT (1330)

(1500)

(1510)IF TERM IS ENCOUNTERED THAT IS RECOGNIZED AS INTRODUCED IN OTHER UNIT, INCREMENT COUNTER AND - IF FREQUENCY THRESHOLD NOT EXCEEDED GOTO 1540, ELSE (1520)(1512)(1511)QUERY IF OTHER UNIT IS TO BE MARKED AS PREREQUISITE TO CURRENT UNIT - IF YES MARK IT SO AND CLEAR TERM, ELSE (1530)(1522)QUERY IF OTHER UNIT IS TO BE MARKED AS RELATED TO CURRENT UNIT - IF YES MARK IT SO AND CLEAR TERM, ELSE (1540)(1532)IF TERM IS ENCOUNTERED THAT IS RECOGNIZED AS MENTIONED PROMINENTLY IN OTHER UNIT, INCREMENT COUNTER AND -IF FREQUENCY THRESHOLD NOT EXCEEDED RETURN, ELSE (1550)(1542)QUERY IF OTHER UNIT IS TO BE MARKED AS RELATED TO CURRENT UNIT - IF YES MARK IT SO AND CLEAR TERM, ELSE (1560)(1552) (1551)REPEAT FOR ALL "OTHER" UNITS IF THEY EXIST, ELSE **▼** (1562) RETURN

FIGURE 15: EXAMPLE OF EXPANSION OF ELEMENT (1340)

(1600)

(1610)

DEFAULT SETTINGS FOR DETAIL, COMPLEXITY, MEDIA, ETC.

(1620)

(1612)

IF STUDENT PROFILE/HISTORY AVAILABLE (VIA TEACHER OR VIA AUTOMATED COMPUTER RECORDS) ADJUST SETTINGS
IN COMBINATION WITH MEDIA UNIT TAGS (1210)

(1630)

(1622)

ESPECIALLY IF NO STUDENT PROFILE/HISTORY, OPTIONALLY QUERY RE: AGE, EDUCATION, FAMILIARITY WITH SUBJECT, GOALS, ETC. - ADJUST SETTINGS ACCORDINGLY

(1640)

▼ (1632)

ADJUST LEVELS ACCORDING TO EXPLICIT REQUESTS MADE BY STUDENT-USER (NOMINALLY VIA BUTTON OF OTHER GUI WIDGET):
More/less detail (interest level/educational goal).
More/less sophisticated language (reading level).
More/less complexity (cognitive level).
More/less graphic illustration, animation, A/V, etc.
More/less (no) assessment (may not be up to student).
More/less related links and 'sidebars', etc.
More/less repetition and reenforcement.
Etc.

(1650)

(1642)

ADJUST LEVELS ACCORDING TO IMPLICIT ANALYSIS MADE OF LEVELS OF ATTENTION, INTEREST AND COMPREHENSION OF STUDENT-USER, DERIVED FROM:

Frequency of requests for related/repeated matter, etc. Correct vs. wrong answers on assessment.

Speed of answers and amount of mis(re)-typing.

Other keyboard and mouse dynamics.

Biometrics of facial expressions.

Behavioral dynamics (fidgeting, etc.)

SOME ELEMENTS A PRIORI, OTHERS MUST RELATE TO STUDENT PROFILE/HISTORY FOR VALIDITY

(1660)

(1652)

RULES FOR CONFLICT OF (1620), (1630), (1640) OR (1650) E.G.: AVERAGE, MAJORITY, PRIORITY, ETC.

FIGURE 16: EXAMPLE OF EXPANSION OF PART OF ELEMENT (1140)

(1700)

(1710)

IF HELP REQUEST IS GENERAL HELP TYPE, TRANSFER TO MAIN PROGRAM HELP FUNCTION, ELSE

(1720)

(1712)

IF HELP REQUEST IS "SHOW ME" HELP TYPE, PRESENT GRAPHIC, ANIMATION OR VIDEO, IF AVAILABLE, ELSE

(1730)

▼ (1722)

IF HELP REQUEST IS "TELL ME MORE" HELP TYPE, PRESENT A MORE DETAILED VERSION OF MATERIAL AND/OR LINKS TO RELATED MATERIAL, IF AVAILABLE, ELSE

(1740)

(1732)

IF HELP REQUEST IS "TELL ME AGAIN" HELP TYPE, PRESENT A DIFFERENT ARTICULATION AND/OR AN ANALOGY, IF AVAILABLE, ELSE

(1750)

(1742)

IF HELP REQUEST IS "GIVE ME AN EXAMPLE" HELP TYPE, PRESENT AN EXAMPLE, IF AVAILABLE, ELSE

(1760)

▼ (1752)

IF HELP REQUEST IS "WHAT IS IT GOOD FOR" HELP TYPE, PRESENT A DESCRIPTION OF WHAT THE MATERIAL IN THIS UNIT IS USEFUL FOR, IF AVAILABLE, ELSE

(1770)

(1762)

IF HELP REQUEST IS "HOW IS IT USED?" HELP TYPE, PRESENT A DESCRIPTION OF HOW THE MATERIAL IN THIS UNIT IS USED, IF AVAILABLE, ELSE

(1780)

' (1772)

IF ANY OF THE REQUESTED MATERIAL IS NOT AVAILABLE, OFFER TO CONNECT TO (CHAT), OR LEAVE MESSAGE FOR (EMAIL, NEWS) HUMAN TEACHER AND/OR PEER, VIA ELECTRONIC MEANS

FIGURE 17: Example of Expansion of Part of Element (1170)